

# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Data Sampling System for Monitor and Control Station

A digital data sampling system with random access capability can be used as a monitoring station in such areas as hospital wards, production-line processes, and water pollution control sites for recording contamination levels.

The system design is based on the development of standardized, interchangeable modules that minimize power dissipation, interconnecting cables, and size. Maximum flexibility is achieved by using a building block approach in which all data modules are basically identical and can be connected at any remote location and addressed in a random fashion from a central unit.

The data system accepts inputs from 128 data modules, with each module handling 8 channels of data, for a total of 1024 remotely located sources. The various modules are connected along a common command-response power cable at random intervals in party line fashion, and are addressed by a unique command address word.

Upon receipt of the proper command address word, a channel within a particular module accepts analog data from the source, converts the data to digital form, transmits the response word back to a central location, and presents the data in the proper format to a central processor. Multiplexing techniques minimize the cabling requirements; and the use of nearly identical circuitry, for both high level and low level data, minimizes the development of special integrated circuit arrays and reduces spare parts requirements. The extensive use of metal-oxide-silicon large scale integration techniques

greatly reduces the number of circuit chips required to construct a complete data module, and consequently results in reduced size and power and increased system reliability.

Salient features of this system include: (1) single command and response line for all modules; (2) three-level command and response signals; (3) all response timing controlled by command signal; (4) interleave mode for double data rate; (5) channel address sent before module address; and (6) hard-wired interchangeable address at each module.

#### **Note:**

Requests for further information may be directed to:

Technology Utilization Officer  
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Reference: B71-10299

#### **Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to:

Patent Counsel  
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Source: General Instrument Corp.  
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